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3000 K STREET NW
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EXAMINER	
SHAPIRO, LEONID	
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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No. 09/746,405	Applicant(s) HILL, NICHOLAS P.R.	
	Examiner Leonid Shapiro	Art Unit 2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-16,18-33,35-62,64-70,72-74,76-79,81,82,84-88 and 90-100* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-16,18-33,35-62,64-70,72-74,76-79,81,82,84-88 and 90-100* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 January 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Drawings

1. The corrected drawings were received on 01-13-03. These drawings are Figs. 1-10d.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 7-9, 20,21-26, 39-41, 50, 52-55, 62, 66, 67, 69, 76-79, 84, 87, 98-100 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al. (US Patent 5, 329, 070) in view of Kambara et al. (US Patent N0. 6,091,406) and further in view of Gill et al. (US Patent No. 5,831,934).

As to claim 1, Knowles et al. teaches a method of determining information relating to a contact on a passive contact sensitive device with steps of: providing a member capable of supporting wave vibration (See Fig. 3, item 10, in description See Col. 6, Lines 46-53), contacting the member at a distance location to generate wave vibration in the member (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), measuring the wave vibration in the member to determine a measured bending wave signal (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), and processing the measured wave signal to calculate information relating the contact (See Fig. 5, items 72, 88, 101, In description See Col. 10, Lines 1-19).

Knowles et al. does not show bending wave vibration.

Kambara et al. teaches bulk waves propagated through the substrate (See Fig. 5, items 1-8, in description See Col. 7, Lines 5-9 and from Col. 17, Line 60 to Col. 18, Line 12). It would have been obvious to one of ordinary skill in the art at the time of invention use Kambara et al. approach in the Knowles et al. apparatus in order to use bulk waves propagated through substrate (See Col. 7, Lines 5-8 in the Kambara et al. reference).

Knowles et al. and Kambara et al. do not show a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al. and Kambara et al. apparatus and method in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

As to claim 22, Knowles et al. teaches a method of determining information relating to a contact on a active contact sensitive device with steps of: providing a member capable of supporting wave vibration (See Fig. 3, item 10, in description See Col. 6, Lines 46-53), generating wave vibration in the member to probe for information relating to the contact (See Fig. 3, items 18, 20, 22, 24, in description See Col. 7, Lines 16-21), contacting the member at a distance location to generate wave vibration in the member (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), measuring the bending wave vibration in the member to determine a measured wave signal (See Fig. 8, items t-tx and t-ty, in description See Col. 9,

Lines 19-30), and processing the measured wave signal to calculate information relating the contact (See Fig. 5, items 72, 88, 101, In description See Col. 10, Lines 1-19).

Knowles et al. does not show bending wave vibration.

Kambara et al. teaches bulk waves propagated through the substrate (See Fig. 5, items 1-8, in description See Col. 7, Lines 5-9 and from Col. 17, Line 60 to Col. 18, Line 12). It would have been obvious to one of ordinary skill in the art at the time of invention use Kambara et al. approach in the Knowles et al. apparatus in order to use bulk waves propagated through substrate (See Col. 7, Lines 5-8 in the Kambara et al. reference).

Knowles et al. and Kambara et al. do not show a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al. and Kambara et al. apparatus and method in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

As to claim 52, Knowles et al. teaches a method of determining information relating to a contact on a active contact sensitive device with steps of: providing a member capable of supporting wave vibration (See Fig. 3, item 10, in description See Col. 6, Lines 46-53), generating wave vibration in the member to probe for information relating to the contact (See Fig. 3, items 18, 20, 22, 24, in description See Col. 7, Lines 16-21), contacting the member at a distance location to generate wave vibration in the member (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), measuring the wave vibration in the member to determine

a measured bending wave signal (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), and processing the measured wave signal to calculate information relating the contact (See Fig. 5, items 72, 88, 101, In description See Col. 10, Lines 1-19).

Knowles et al. does not show bending wave vibration.

Kambara et al. teaches bulk waves propagated through the substrate (See Fig. 5, items 1-8, in description See Col. 7, Lines 5-9 and from Col. 17, Line 60 to Col. 18, Line 12). It would have been obvious to one of ordinary skill in the art at the time of invention use Kambara et al. approach in the Knowles et al. and Kambara et al. apparatus and method in order to use bulk waves propagated through substrate (See Col. 7, Lines 5-8 in the Kambara et al. reference).

Knowles et al. and Kambara et al. do not show a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al. apparatus in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

As to claim 62, Knowles et al. teaches a passive contact sensitive device with: a member capable of supporting wave vibration (See Fig. 3, item 10, in description See Col. 6, Lines 46-53), at least one sensor coupled to the member for measuring the wave vibration in the member (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), a processor operatively coupled to the at least sensor for processing information relating to the contact made on surface on the member from the generation of wave vibration created by the contact and

measured by the at least one sensor (See Fig. 5, items 72, 88, 101, In description See Col. 10, Lines 1-19).

Knowles et al. does not show bending wave vibration.

Kambara et al. teaches bulk waves propagated through the substrate (See Fig. 5, items 1-8, in description See Col. 7, Lines 5-9 and from Col. 17, Line 60 to Col. 18, Line 12). It would have been obvious to one of ordinary skill in the art at the time of invention use Kambara et al. approach in the Knowles et al. apparatus and method in order to use bulk waves propagated through substrate (See Col. 7, Lines 5-8 in the Kambara et al. reference).

Knowles et al. and Kambara et al. do not show a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al. and Kambara et al. apparatus and method in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

As to claim 98, Knowles et al. teaches an active contact sensitive device with: a member capable of supporting wave vibration (See Fig. 3, item 10, in description See Col. 6, Lines 46-53), an emitting transducer for exciting wave vibration in the member to probe for information relating to the contact (See Fig. 3, items 18, 20, 22, 24, in description See Col. 7, Lines 16-21), a sensor mounted on the member for measuring the wave vibration in the member (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), and processor operatively coupled to the sensor for processing information relating the contact made on a surface on the

member from the change in wave vibration caused by the contact (See Fig. 5, items 72, 88, 101, In description See Col. 10, Lines 1-19).

Knowles et al. does not show how to apply a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Knowles et al. does not show bending wave vibration.

Kambara et al. teaches bulk waves propagated through the substrate (See Fig. 5, items 1-8, in description See Col. 7, Lines 5-9 and from Col. 17, Line 60 to Col. 18, Line 12). It would have been obvious to one of ordinary skill in the art at the time of invention use Kambara et al. approach in the Knowles et al. apparatus in order to use bulk waves propagated through substrate (See Col. 7, Lines 5-8 in the Kambara et al. reference).

Knowles et al. and Kambara et al. do not show a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al. and Kambara et al. apparatus and method in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

As to claim 99-100, Knowles et al. teaches a method of determining information relating to a contact on a passive contact sensitive device with steps of: providing a member capable of supporting bending wave vibration (See Fig. 3, item 10, in description See Col. 6, Lines 46-53), contacting the member at a distance location to generate bending wave vibration in the member (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), measuring

the bending wave vibration in the member to determine a measured bending wave signal (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), and processing the measured bending wave signal to calculate information relating the contact (See Fig. 5, items 72, 88, 101, In description See Col. 10, Lines 1-19).

Knowles et al. does not show how to apply a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al. apparatus in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

As to claims 7, 39,53, Knowles et al. teaches about the information related to location of the contact (See Fig. 6, 7 items 100-142, in description See Col. 10, Lines 37-68 and Col. 11, Linesl-53).

As to claims 8, 40, 54, Knowles et al. teaches about the information related to pressure of the contact (See Fig. 8, intensity of the signal at times t-tx and t-ty).

As to claims 9, 41, 55, Knowles et al. teaches about the information related to size of the contact (See Fig. 8, duration of the pulses).

As to claims 20, 50, 84, Knowles et al. teaches about measuring the changed bending wave vibration at an edge of the member (See Fig. 3, items 18, 20, 22, 24, in description See Col. 7, Lines 16-21).

As to claims 23-24, Knowles et al. teaches about reflection by a contact to produce change in the generated bending wave vibration in the member and vibration is measured using indirect excitation from at least one boundary reflection (See Fig. 3, 8 and 9, items 20,24, in description See Col. 9, Lines 19-30)

As to claims 25-26, Knowles et al. teaches about absorption by a contact to produce change in the generated bending wave vibration in the member and vibration is measured using indirect excitation from at least one boundary reflection (See Fig. 3, 8 and 9, items 20,24, in description See Col. 9, Lines 19-30).

As to claim 66, Knowles et al. teaches about generating bending wave vibration in the member from one location the member to probe to probe for information relating to the contact (See Fig. 11, item 18, in description See Col. 17, Lines 15-19).

As to claims 69, 87, Knowles et al. teaches about the member is in the form of a panel (Fig. 3, item 37).

As to claims 76-79, Knowles et al. teaches about emitting transducer coupled to the member for exciting bending wave vibration in the member to probe for information relating to the contact, wherein emitting transducer has dual functionality and acts as the emitting transducer and the at least one sensor with a relatively equal spacing around the periphery of the member (See Fig. 3, items 18, 20, 22, 24, in description See Col. 7, Lines 16-20).

As to claims 21, 67, Kambara shows the piezoelectric transducers mounted on inclined surface (See Fig. 5 and 6, items 4a, 4b and 10a,10b, in description See Col. 18, Lines 5-12).

3. Claims 3,6,35,38,51,85, 93-95, 97, rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. in view of Colloms et al. (WO 97/09847) and further in view of Gill et al..

As to claim 93, Knowles et al. and Kambara et al. teache a member capable supporting bending wave vibration (See Fig. 3, item 10, in description See Col. 6, Lines 46-53), at least one sensor coupled to the member for measuring bending wave vibration in the member (See Fig. 8, items t-tx and t-ty, in description See Col. 9, Lines 19-30), a processor operatively coupled to the at least sensor for processing information relating to the contact made on surface on the member from the generation of bending wave vibration created by the contact and measured by the at least one sensor (See Fig. 5, items 72, 88, 101, In description See Col. 10, Lines 1-19).

Knowles et al. and Kambara et al. do not show how to form an acoustic radiator (a loudspeaker) when excited, an exciter coupled to the member for exciting bending wave vibration in the member to probe for information relating to a contact made on a surface of the member, and to cause member to produce an acoustic output.

Colloms et al. teaches how to form an acoustic radiator (a loudspeaker) when excited (See Fig. 1, items 81, 2, 9, 81, in description See Page 4, Lines 20-25), an exciter coupled to the member for exciting bending wave vibration in the member to probe for information relating to a contact made on a surface of the member, and to cause member to produce an acoustic output (See fig. 3, items 63, 65, 66, in description See Col. 11, Lines15-23). It would have been obvious to one of ordinary skill in the art at the time of invention use Colloms et al. approach in the Knowles et al. and Kambara et al. apparatus and method in order to use electro-mechanical means in order to excite the radiator panel (See Col. 2, Lines 2-5 in Colloms et al. reference).

Knowles et al., Kambara et al. and Colloms et al. do not show to apply a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al., Kambara et al. and Colloms et al. apparatus in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

As to claims 94-95, Colloms et al. teaches about the member is in the form of a panel, which has uniform thickness (See Fig. 2b, item 2, 22, in description See P age 6, Lines 2-26).

As to claim 97, Colloms et al. teaches about at least one sensor is mounted on the member spaced from the edge of the member (See Fig. 3, items 63, 65, 66, in description See Page 11, Lines 15-23).

As to claims 3, 6, 35, 38, 51, 85, Knowles et al. and Kambara et al. do not teach a correction to convert the measured bending wave signal to a propagation signal from a non-dispersive wave source, connected to a material of a member and using self-measuring scheme which is incorporated into the contact sensitive device source.

Gill et al. teaches to apply a correction to convert the measured bending wave signal to a propagation signal by fitting the data to a mathematical model of dispersion (See Col. 27, Lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of invention use Gill et al. approach in the Knowles et al., Kambara et al. and Colloms et al. apparatus in order to provide improved measurements (See Col. 27, Line 62 in Gill et al. reference).

4. Claims 4, 36 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claims 3, 35 in view of Weigers et al. (US Patent No.
5,856,820).

Knowles et al., Kambara et al. and Gill et al. do not teach about the modeling by using the bending wave equation in combination with known physical parameters of the material of the member.

Weigers et al. show the usage of the wave equation in relation to the backing layer (See in description Col. 2, Lines 63-66). It would been obvious to the one ordinary skill in the art in the time of invention to use Weigers et al. approach in the Knowles et al., Kambara et al. and Gill et al. method in order to improve the quality of the touch detection.

5. Claims 5, 37 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claim 3, 35 in view of Zook et al. (US Patent No. 6,246,638 B 1).

Knowles et al., Kambara et al. and Gill et al. do not teach about the dispersion relation is measured by using a laser vibrometer to create an image of the vibration pattern in the member for a number of given frequencies to give the dispersion relation in the frequency range of interest.

Zook et al. show the usage of the laser vibrometer to measure the amplitude of vibration for the given frequency (See in description Col 5, Lines 57-60). It would been obvious

to the one ordinary skill in the art in the time of invention to use Zook et al. approach in the Knowles et al., Kambara et al. and Gill et al. method in order to improve the quality of the touch detection.

6. Claims 12-14, 44-46, 58-59 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claims 1, 22, 52 in view of Takahashi et al. (US Patent No. 5,638,093).

Knowles et al., Kambara et al. and Gill et al. do not teach about determination by the frequency content of measured bending wave of the contact type (finger or stylus).

Takahashi et al. shows how to determine accurately and stably the contact type by the width of the area touched (See Fig. 3, 7, item 201-210, in description See Col. 4, Lines 31-36 and Col. 7, 62-66). As notoriously well known in the art there is direct relationship between the width of the pulse (See Fig. 7) in the time domain and the frequency content in the frequency domain. It would been obvious to the one ordinary skill in the art in the time of invention to use Takahashi et al. approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection.

7. Claims 15, 47 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claims 1, 22 in view of Tager et al. (US Patent No. 6,160,757).

Knowles et al., Kambara et al. and Gill et al. do not teach about the usage an adaptive algorithm to derive information relating to the contact from measuring bending wave signal.

Tager et al shows how to use adaptive algorithms to estimate field for acoustic-pickups (See in description Col.5, Lines 50-67). It would been obvious to the one ordinary skill in the art in the time of invention to use Tager et al. approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection with member of complex shape.

8. Claims 16, 48, rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al., Gill et al. and Tager et al. as aforementioned in claims 15, 47 in view of Hoffberg et al. (US Patent No. 6,400,996 B1).

Knowles et al., Kambara et al., Gill et al. and Tager et al. do not teach about the implementation of adaptive algorithm in a neural net.

Hoffberg et al. teaches about neural networks as important tools for extracting patterns from complex input sets (See in description Col. 21, Lines 18-30). It would been obvious to the one ordinary skill in the art in the time of invention to use Hoffberg et al. approach in the Knowles et al., Kambara et al., Gill et al. and Tager et al. apparatus in order to improve the quality of the touch detection with member of complex shape with the usage of an adaptive algorithm.

9. Claim 18 rejected under 35 U. S. C. 103 (a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claim 1 in view of Flowers (US Patent No. 6,160,757).

Knowles et al., Kambara et al. and Gill et al. do not teach about the bending wave vibration in the member is caused by the background noise.

Flowers describes the background noise in location system (See in description Col.3, Lines 23-25). It would have been obvious to the one ordinary skill in the art in the time of invention to use Flowers approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection by reducing the background noise.

10. Claims 19, 33, 49, 60-61 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claims 1, 22, 52 in view of Kent (US Patent No. 5,986,224).

As to claims 19, Knowles et al., Kambara et al. and Gill et al. do not teach about comparing the measured bending wave signal with a reference signal to identify when contact made.

Kent teaches about reference signal compensating for many physical characteristics, drift, temperature... (See in description Co1.40, Lines 29-33). It would been obvious to the one ordinary skill in the art in the time of invention to use Kent approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection by the use of the reference signal.

As to claim 33, 49, 60-61 Knowles et al., Kambara et al. and Gill et al. do not teach about the processing step of isolating undesired signals from the changed bending wave vibration produced by the contact by comparing the measured bending wave signal with a reference signal to identify when contact made.

Kent teaches about reference signal compensating for many physical characteristics, drift, temperature... (See in description Co1.40, Lines 29-33). It would been obvious to the one ordinary skill in the art in the time of invention to use Kent approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection by the use of the reference signal.

11. Claim 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claim 22 in view of Azima (WO 97/09847).

Knowles et al., Kambara et al. and Gill et al. does not teach about an acoustic radiator of a loudspeaker.

Azima shows an acoustic radiator of a loudspeaker as panel-form loudspeaker (See 1, items 1, 2, 9, in description See page 4, Lines 21-19).). It would have been obvious to the one ordinary skill in the art in the time of invention to use Azima approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection.

12. Claim 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al., Gill et al. and Azima as aforementioned in claim 31 in view of Kent.

Knowles et al., Kambara et al., Gill et al. and Azima do not teach about the processing step of isolating undesired signals from the changed bending wave vibration produced by the contact by comparing the measured bending wave signal with a reference signal to identify when contact made.

Kent teaches about reference signal compensating for many physical characteristics, drift, temperature... (See in description Col.40, Lines 29-33). It would been obvious to the one ordinary skill in the art in the time of invention to use Kent approach in the Knowles et al., Kambara et al., Gill et al. and Azima apparatus in order to improve the quality of the touch detection by the use of the reference signal. It need to be noted that Azima uses multiple sensors.

13. Claims 68, 70, 86, 88, rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claim 62, 75 in view of Hotta et al. (US Patent No. 4,389,711).

Knowles et al., Kambara et al. and Gill et al. do not teach about the member is transparent with uniform thickness.

Hotta et al. show the usage of the transparent member (See Fig. 2, item 3, in description Col 5, Lines 1-2). It would been obvious to the one ordinary skill in the art in the time of invention to use Hotta et al. approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection.

14. Claims 73-74, 91-92, 64-65, 81-82, rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claims 62-63, 75 in view of Koh et al. (US Patent No 6,335,725 B l).

As to claims 73-74, 91-92, Knowles et al., Kambara et al. and Gill et al. do not teach about a lap-top computer or a personal data assistant with contact sensitive device.

Koh et al. shows the usage of the contact sensitive device in a lap-top computer or a personal data assistant (See Fig. 1, items 2, 4, 8, in description Col 3, Lines 23-29). It would been obvious to the one ordinary skill in the art in the time of invention to use Knowles et al., Kambara et al. and Gill et al. device in the Koh et al. apparatus in order to widen the area of applications for touch sensitive devices.

As to claims 64-65, 81-82, Knowles et al., Kambara et al. and Gill et al. do not teach LCD display screen.

Koh et al. shows LCD display screen (See Fig. 1, items 2, 4, 8, in description Col 3, Lines 23-29). It would been obvious to the one ordinary skill in the art in the time of invention to use Knowles et al., Kambara et al. and Gill et al. device in the Koh et al. apparatus in order to widen the area of applications for touch sensitive devices.

15. Claims 72, 90 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claims 62, 75 in view of Ketwich (US Patent No 6,072,475).

Knowles et al., Kambara et al. and Gill et al. do not teach about mobile phone with contact sensitive device.

Ketwich shows the usage of the contact sensitive device in a mobile phone (See Fig. 12b, item 1975, iteml911, in description Col 11, Lines 48-53). It would been obvious to the one ordinary skill in the art in the time of invention to use Knowles et al., Kambara et al. and Gill et al. device in the Ketwich apparatus in order to widen the area of applications for touch sensitive devices.

16. Claim 96 rejected under 35 U. S. C. 103 (a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al.,Colloms et al. as aforementioned in claim 93 in view of Romein (US Patent No. 4,246,439).

over Knowles et al., Kambara et al. and Gill et al.,Colloms et al. do not teach about at least one sensor is mounted at

the edge of the member.

Romein shows sensors are mounted at the edge of the member (See Fig. 1, items 6-7, in description Col 2, Lines 18-29). It would been obvious to the one ordinary skill in the art in the time of invention to use Romein located sensors in over Knowles et al., Kambara et al. and Gill et al.,Colloms et al. apparatus in order to widen the area of applications for touch sensitive devices.

17. Claims 10-11, 42-43, 56-57, rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al., Kambara et al. and Gill et al. as aforementioned in claims 1, 22, 52 in view of Hoffberg et al. (US Patent No. 6,400,996 B1).

Knowles et al., Kambara et al. and Gill et al. do not teach about the implementation of adaptive algorithm in a neural net.

Hoffberg et al. teaches about neural networks as important tools for extracting patterns from complex input sets (See in description Col. 21, Lines 18-30). It would been obvious to the

one ordinary skill in the art in the time of invention to use Hoffberg et al. approach in the Knowles et al., Kambara et al. and Gill et al. apparatus in order to improve the quality of the touch detection with member of complex shape with the usage of an adaptive algorithm.

18. Claims 27-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Knowles et al. and Kambara et al. as aforementioned in claim 22 in view of Kinra (US Patent No. 5,305,239).

Knowles et al. and Kambara et al. do not show vibration is not acoustically obvious, outside the audible frequency range and is in ultrasonic frequency range.

Kinra teaches vibration is not acoustically obvious, outside the audible frequency range and is in ultrasonic frequency range (See Figs. 7-10, items 145-151, in description See Col. 10, Lines 58-68 and Col. 11, Lines 1-16). It would have been obvious to one of ordinary skill in the art at the time of invention use Kinra approach in the Knowles et al. Kambara et al. apparatus and method.

Response to Amendment

19. Applicant's arguments filed on 06-18-03 with respect to claims 1, 3-16,18-33, 35-62, 64-70, 72-74, 76-79, 81-82, 84-88, 90-100 have been considered but are moot in view of the new ground(s) of rejection.

Telephone inquire

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Shapiro whose telephone number is 703-305-5661. The examiner can normally be reached on 8 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 703-305-4938. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

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June 30, 2003

BIPIN SHALWALA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER